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MPU150/MDU150 SERIES

The innovative MPU products incorporate Power Factor Correction (PFC) with a low-profile package designed to meet 1U height constraints. The MPU150-4530 and MPU150-4350 provide high current +3.3V and +5V on a single platform to support mixed-mode, high-speed digital circuitry. Power-One's unique dual converter architecture combines high reliability with exceptional regulation.

All multiple output models feature remote sense on outputs V1 and V2 to provide independent compensation of output cable losses. Other standard features include independent current sharing on V1 and V2, thermal shutdown, and remote inhibit. Airflow of 300 linear feet per minute (LFM) is required to deliver the full power density of 3.0 watts per cubic inch.

The MDU150 series provides the same benefits as the MPU150 series, with nominal 48 volt DC input.

FEATURES

- Power Factor Correction (PFC) Meets EN61000-3-2
- Low Profile Height Fits 1U Constraints
- Dual Main Outputs Provide 3.3V and 5V for Mixed Mode Applications
- Single Wire Current Sense on Outputs V1 and V2
- Remote Sense on Outputs V1 and V2
- Overtemperature, Overload, and Overvoltage Protection
- Available with Metric or SAE Mountings
- Greater than 340,000 Hours MTBF
- MDU150 Models have 48VDC Input

AC INPUT, SINGLE OUTPUT MODEL SELECTION CHART

180W WITH 300 LFM FORCED AIR COOLING

MODEL	OUTPUT VOLTAGE	ADJUSTMENT RANGE	MAXIMUM OUTPUT CURRENT (NOTE 1)	LINE REGULATION	LOAD REGULATION	RIPPLE & NOISE %p-p (NOTE 2)	INITIAL SETTING ACCURACY
MPU150-S259	12V	11.6V to 16V	15A (Note 3)	0.1%	1%	1%	11.97V to 12.03V
MPU150-S262	24V	22.8V to 29.2V	7.5A (Note 3)	0.1%	1%	1%	23.95V to 24.05V
MPU150-S261	48V	45V to 56V	3.75A (Note 3)	0.1%	1%	1%	47.9V to 48.1V

AC INPUT, MULTIPLE OUTPUT MODEL SELECTION CHART – 150W WITH 300 LFM FORCED AIR COOLING

ISOLATED V3 AND V4 CAN BE USED AS POSITIVE OR NEGATIVE OUTPUTS

MODEL	OUTPUT VOLTAGE	ADJUSTMENT RANGE	OUTPUT CURRENT (NOTE 1)	LINE REGULATION	LOAD REGULATION	RIPPLE & NOISE %Pk-Pk (NOTE 2)	INITIAL SETTING ACCURACY
MPU150-3320	+3.3V	3.15V to 3.80V	35A	0.6%	1.5%	1.5%	3.28V to 3.32V
	+2.5V	2.25V to 3.0V	20A	0.8%	2%	2%	2.49V to 2.51V
	+12V	Fixed	3A	0.4%	3%	1%	11.76V to 12.24V
MPU150-3300	+3.3V	3.15V to 3.80V	35A	0.6%	1.5%	1.5%	3.28V to 3.32V
	+5V	5.0V to 5.5V	20A	0.4%	3%	1%	4.98V to 5.02V
	+12V	Fixed	2A	0.4%	3%	1%	11.76V to 12.24V
MPU150-3524	+5V	5.0V to 5.5V	17.5A	0.4%	1%	1%	4.98V to 5.02V
	+12V	10.8V to 13.2V	4A	0.4%	3%	1%	11.94V to 12.06V
	+24V	Fixed	2A	0.4%	3%	1%	23.52V to 24.48V
MPU150-4000	+5V	5.0V to 5.5V	30A (Note 4)	0.4%	1%	1%	4.98V to 5.02V
	+12V	10.8V to 13.2V	8A	0.4%	1%	1%	11.94V to 12.06V
	12V	10.8V to 13.2V	3A	0.4%	1%	1%	11.94V to 12.06V
	5V	5.0V to 5.5V	2A	0.4%	1%	1%	4.98V to 5.02V
MPU150-4230	+2.5V	2.25V to 3.0V	30A (Note 4)	0.8%	2%	2%	2.49V to 2.51V
	+3.3V	3.15V to 3.8V	15A (Note 4)	0.6%	1.5%	1.5%	3.28V to 3.32V
	12V	10.8V to 13.2V	4A (Note 5)	0.4%	1%	1%	11.94V to 12.06V
	5V	5.0V to 5.5V	2A (Note 5)	0.4%	1%	1%	4.98V to 5.0V
MPU150-4350	+3.3V	3.15V to 3.80V	30A (Note 4)	0.6%	1.5%	1%	3.28V to 3.32V
	+5V	5.0V to 5.5V	15A (Note 4)	0.4%	1%	1%	5.00V to 5.04V
	12V	10.8V to 13.2V	3A (Note 5)	0.4%	7%	1%	11.94V to 12.06V
	12V	10.8V to 13.2V	3A (Note 5)	0.4%	7%	1%	11.94V to 12.06V
MPU150-4530	+5V	5.0V to 5.5V	30A (Note 4)	0.4%	1%	1%	4.98V to 5.02V
	+3.3V	3.15V to 3.60V	15A (Note 4)	0.6%	1.5%	1.5%	3.28V to 3.32V
	12V	10.8V to 13.2V	3A (Note 5)	0.4%	7%	1%	11.94V to 12.06V
	12V	10.8V to 13.2V	3A (Note 5)	0.4%	7%	1%	11.94V to 12.06V

NOTES: 1) Output currents ratings are expressed with 300 LFM forced air.
2) Maximum peak-to-peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.
3) Total power of 180 Watts.
4) Total current between V1 and V2 is 30A, maximum rating.
5) Total current between V3 and V4 is 5A, maximum rating.

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MPU150/MDU150 SERIES

DC INPUT MODEL SELECTION CHART – 150W WITH 300 LFM FORCED-AIR COOLING
ISOLATED V3 AND V4 CAN BE USED AS POSITIVE OR NEGATIVE OUTPUTS

MODEL	OUTPUT VOLTAGE	ADJUSTMENT RANGE	OUTPUT CURRENT (NOTE 1)	LINE REGULATION	LOAD REGULATION	RIPPLE & NOISE %Pk-Pk (NOTE 2)	INITIAL SETTING ACCURACY
MDU150-3300	+3.3V	3.15V to 3.80V	35A	0.6%	1.5%	1.5%	3.28V to 3.32V
	+5V	5.0V to 5.5V	20A	0.4%	3%	1%	4.98V to 5.02V
	+12V	N/A	2A	0.4%	3%	1%	11.76V to 12.24V
MDU150-4000	+5V	5.0V to 5.5V	30A (Note 3)	0.4%	1%	1%	4.98V to 5.02V
	+12V	10.8V to 13.2V	8A	0.4%	1%	1%	11.94V to 12.06V
	12V	10.8V to 13.2V	3A	0.4%	1%	1%	11.94V to 12.06V
	5V	5.0V to 5.5V	2A	0.4%	1%	1%	4.98V to 5.02V
MDU150-4230	+2.5V	2.25V to 3.0V	30A (Note 3)	2%	2%	2%	2.49V to 2.51V
	+3.3V	3.15V to 3.8V	15A (Note 3)	1.5%	1.5%	1.5%	3.28V to 3.32V
	12V	10.8V to 13.2V	3A	1%	1%	1%	11.94V to 12.06V
	5V	5.0V to 5.5 V	2A	1%	1%	1%	4.98V to 5.0V
MDU150-4350	+3.3V	3.15V to 3.8V	30A (Note 5)	1.5%	1.5%	1%	3.28V to 3.32V
	+5V	5.0V to 5.5V	15A (Note 5)	1%	1%	1%	5.00V to 5.04V
	12V	10.8V to 13.2V	3A (Note 4)	7%	7%	1%	11.94V to 12.06V
	12V	10.8V to 13.2V	3A (Note 4)	7%	7%	1%	11.94V to 12.06V
MDU150-4530	+5V	5.0V to 5.5V	30A (Note 3)	0.4%	1%	1%	4.98V to 5.02V
	+3.3V	3.15V to 3.60V	15A (Note 3)	0.6%	1.5%	1.5%	3.28V to 3.32V
	12V	10.8V to 13.2V	3A (Note 4)	0.4%	7%	1%	11.94V to 12.06V
	12V	10.8V to 13.2V	3A (Note 4)	0.4%	7%	1%	11.94V to 12.06V

MPU150 INPUT SPECIFICATIONS

PARAMETER	CONDITIONS/DESCRIPTION		MIN	NOM	MAX	UNITS
Input Voltage - AC	Continuous input range.		85		264	VAC
Input Frequency	AC input.		47		63	Hz
Hold-up Time	After last AC line peak at 150 watts.	MPU150-4350	17.5			ms
		All other models	20			
Input Current	85 VAC at full rated load.	MPU150			3.0	ARMS
Input Protection	Non-user serviceable internally located AC input line fuse.					
Inrush Surge Current	Internally limited by thermistor. Vin = 230 VAC, one cycle, 25°C.				35	APK
Power Factor	Per EN61000-3-2.		0.95			W/VA
Operating Frequency	Switching frequency of main output transformer.		100		120	kHz
	Switching frequency of secondary transformer.		65		90	
	Switching frequency of Power Factor Correction circuit.			60		

MDU150 INPUT SPECIFICATIONS

PARAMETER	CONDITIONS/DESCRIPTION	MIN	NOM	MAX	UNITS
Input Voltage - DC	Continuous input range.	36		75	VDC
Brown Out Protection	Lowest DC input voltage that regulation is maintained with full rated loads.	34			VDC
Hold-up Time	At 150 watts, over DC input range.	20			ms
Input Current	36 VDC at full rated load.			6.4	ARMS
Input Protection	Non-user serviceable internally located AC input line fuse.				
Inrush Surge Current	Vin = 72 VDC.			35	APK
Operating Frequency	Switching frequency of main output transformer.		100		kHz
	Switching frequency of secondary transformer.		70		

NOTES: 1) Output currents ratings are expressed with 300 LFM forced air.
2) Maximum peak-to-peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.
3) Total current between V1 and V2 is 30A, maximum rating.
4) Total current between V3 and V4 is 5A, maximum rating.
5) Total current between V1 and V2 is 40A, maximum rating.

MPU150/MDU150 SERIES

OUTPUT SPECIFICATIONS

PARAMETER	CONDITIONS/DESCRIPTION		MIN	NOM	MAX	UNITS
Efficiency	Full Rated Load, 110 VAC. Varies with distribution of loads among outputs.		65	75		%
Minimum Load, V1	Minimum load required to maintain regulation on V2 at maximum load.	MPU150-3300, V1 All other models, V1	4 3			A
Minimum Load, V3	Minimum load required to maintain regulation on V4 at maximum load.	MPU150-3300, V3 All other models, V3	N/A 0.3			A
Ripple and Noise	Full load, 20 MHz bandwidth.			See Model Selection Charts		
Output Power	With 300 LFM forced air cooling. (Note 1)			150		Watts
Overshoot / Undershoot	Output voltage overshoot/undershoot at turn-on.				0	%
Regulation	Varies by output. Total regulation includes: line changes over the specified. input range, changes in load starting at 20% load and changing to 100% load.			See Model Selection Charts		
Transient Response	Recovery time, to within 1% of initial set point due to a 50-100% load change, 5% max. deviation.			500		µs
Turn-on Delay	Time required for initial output voltage stabilization.			2		s
Turn-on Rise Time	Time required for output voltage to rise from 10% to 90%.			20		ms

INTERFACE SIGNALS AND INTERNAL PROTECTION

PARAMETER	CONDITIONS/DESCRIPTION		MIN	NOM	MAX	UNITS
Overvoltage Protection	Latch style overvoltage protection. Available on V1, V2, all models, and V3 on all models except MPU150-3300.	2.5V output, V1 3.3V output, V1 3.3V output, V2 5V output, V1, V2 12V output, V2 (Note 2) MPU150-4350 3.3V output, V1	3.0 4.1 3.8 6.0 14 4.3		3.25 4.65 4.2 6.4 16 4.65	V
Overload Protection	Fully protected against output overload and short circuit. Automatic recovery upon removal of overload condition.					
Overtemperature Protection	System shutdown due to excessive internal temperature, automatic reset.					
Output Good	TTL compatible signal available for V1. Signal is high when output is within 5% of nominal. Signal shall remain low for 20 milliseconds following loss of Output Good.	3.3V 5V	3.16 4.75			V
Input Power Fail Warning	TTL compatible logic signal. Time before regulation dropout due to loss of input power. May be used as independent PSOK signal in redundant applications.		5			ms
Current Share	Accuracy of shared current with up to 6 parallel units. Single wire current share on V1 and V2 with return via -Sense return.			10		%
Remote Sense	Available on V1 and V2. Total voltage compensation for cable losses with respect to the main output.				500	mV
Inhibit	Output voltage is inhibited by application of an external high (5V) signal.					

NOTES: 1) Overvoltage range for 12V, V3 outputs: 14V to 19V.

MPU150/MDU150 SERIES

SAFETY, REGULATORY, AND EMI SPECIFICATIONS

PARAMETER	CONDITIONS/DESCRIPTION			MIN	NOM	MAX	UNITS
Agency Approvals	UL1950. CSA 22.2 NO. 234/950. EN60950 (TÜV).					Approved	
Dielectric Withstand Voltage	Input to output per EN60950.		MPU150 MDU150	2600 1544			VDC
Electromagnetic Interference	FCC CFR title 47 Part 15 Sub-Part B - Conducted. EN55022 / CISPR 22 Conducted.			B B			Class
ESD Susceptibility	Per EN61000-4-2, level 4.			8			kV
Radiated Susceptibility	Per EN61000-4-3, level 3.			10			V/M
EFT/Burst	Per EN61000-4-4, level 3.			±2			kV
Input Transient Protection	Per EN61000-4-5, class 3.	MPU150: MPU150: MDU150: MDU150:	Line to Line Line to Ground Line to Line Line to Ground	1 2 0.5 0.5			kV
Insulation Resistance	Input to output.				10		MΩ
Leakage Current	Per EN60950.		MPU150 at 264 VAC MDU150 at 72 VDC			1250 100	µA

NOTES: 1) This product is not rated for convection applications.
2) Overvoltage range for 12V, V3 outputs: 14V to 19V.

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITIONS/DESCRIPTION		MIN	NOM	MAX	UNITS
Altitude	Operating. Non-Operating.				10k 40k	ASL Ft. ASL Ft.
Operating Temperature	 Derate linearly above 50°C by 2.5% per °C.	At 100% load At 50% load	0 0		50 70	°C °C
Storage Temperature			-55		85	°C
Temperature Coefficient	0°C to 70°C (after 15 minute warm-up).			±0.02	±0.05	%/°C
Relative Humidity	Non-Condensing.		5		95	%RH
Shock	Peak acceleration.				20	GPK
Vibration	Random vibration, 10Hz to 2kHz, 3 axis.				6	GRMS

OPTIONS

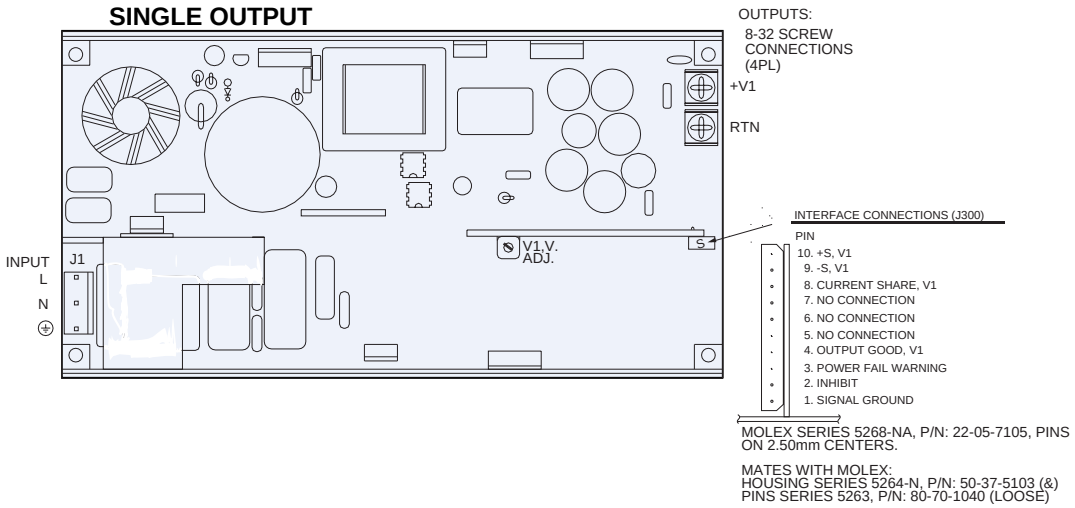
DESCRIPTION	NOTES	SIZE IMPACT
Metric Mounting	Add "M" as a suffix to the model number to order chassis with M4 x 0.7 mounting inserts. Metric mounting inserts are standard for single-output models MPU150-S259, MPU150-S261, and MPU150-S262.	8.00" x 4.20" x 1.50" (203.2mm x 106.7mm x 38.1mm)

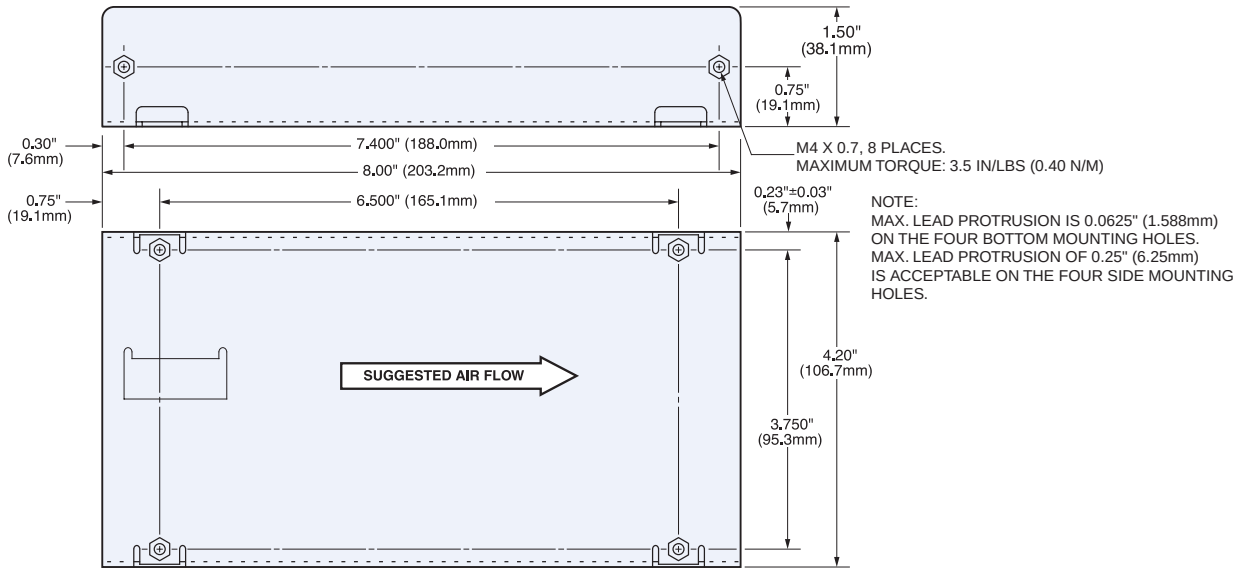
NUCLEAR AND MEDICAL APPLICATIONS - Power-One products are not authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of the respective divisional President of Power-One, Inc.

TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

MPU150/MDU150 SERIES

OVERALL SIZE: 8.00" x 4.20" x 1.50" (203.2mm x 106.7mm x 38.1mm) WEIGHT: 2.0 LBS (0.89 kg)





CONNECTOR	MOLEX SERIES	HOUSING	PIN SERIES	PINS (LOOSE)	PINS (CHAIN)	WIRE GAUGE
J1 (ALL MODELS)	41695	09-50-8051	6838	08-50-0189	08-50-0187	18-20AWG
	41695	09-50-8051	2478	08-50-0106	08-50-0105	18-20AWG
	2139	09-50-3051	2478	08-50-0106	08-50-0105	18-20AWG
J300	5264-N	50-37-5103	5263	08-70-1040	08-70-1039	22-28AWG

CHASSIS: 0.063" (1.6mm) ALUMINUM ALLOY, WITH CLEAR FINISH

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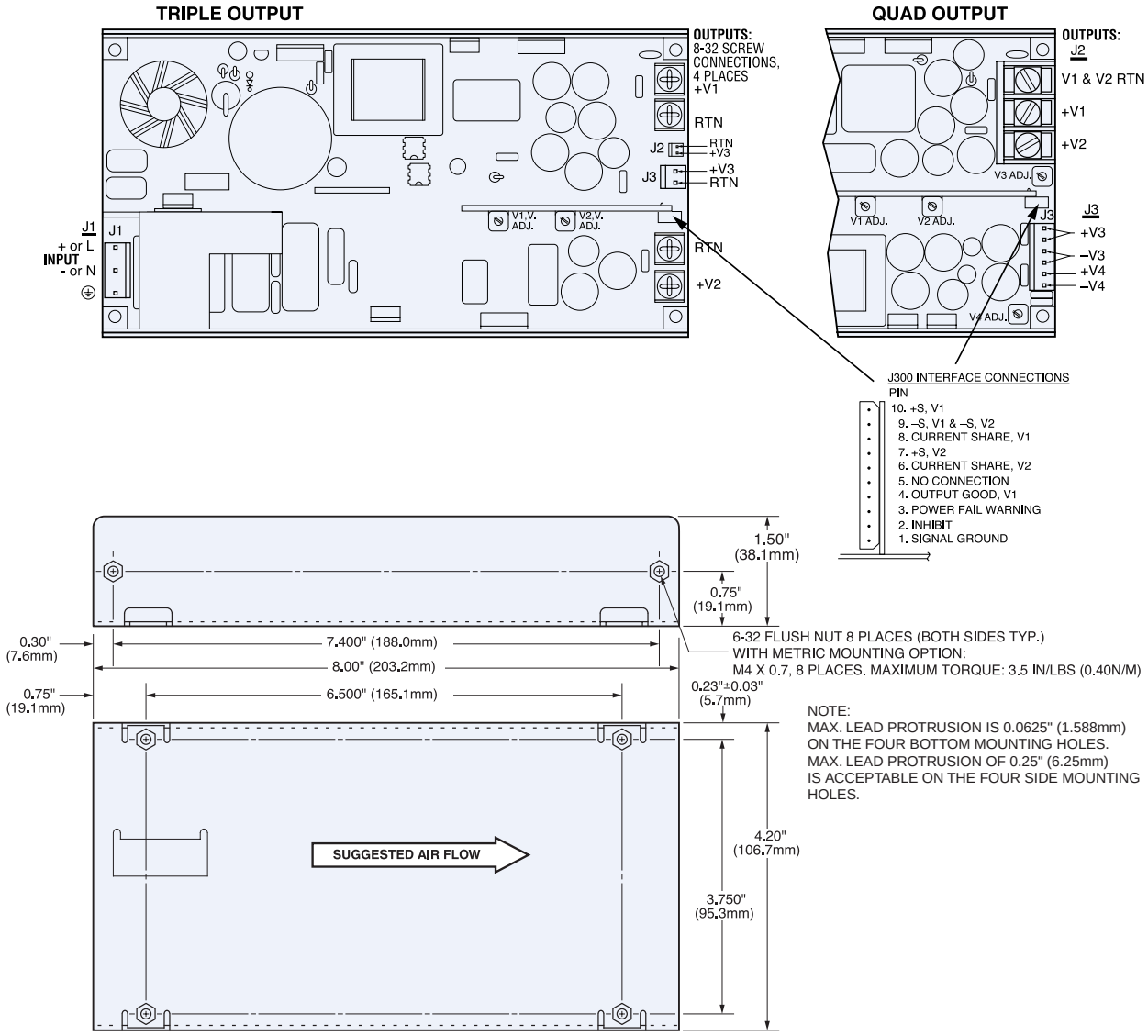
MPU150/MDU150 SERIES

OVERALL SIZE: 8.00" x 4.20" x 1.50" (203.2mm x 106.7mm x 38.1mm) WEIGHT: 2.0 LBS (0.89 kg)



CONNECTOR	MOLEX SERIES	HOUSING	PIN SERIES	PINS (LOOSE)	PINS (CHAIN)	WIRE GAUGE
J1 (ALL MODELS)	41695	09-50-8051	6838	08-50-0189	08-50-0187	18-20AWG
	41695	09-50-8051	2478	08-50-0106	08-50-0105	18-20AWG
	2139	09-50-3051	2478	08-50-0106	08-50-0105	18-20AWG
J2 (TRIPLE OUTPUT)	5051-N	22-01-1022	2759	08-50-0114	08-50-0113	22-30AWG
	5051-N	22-01-1022	2759	08-65-0805	08-65-0804	22-30AWG
J3 (TRIPLE OUTPUT)	41695	09-50-8021	6838	08-50-0189	08-50-0187	18-20AWG
	41695	09-50-8021	2478	08-50-0106	08-50-0105	18-20AWG
	2139	09-50-3021	2478	08-50-0106	08-50-0105	18-20AWG
J3 (QUAD OUTPUT)	41695	09-50-8061	6838	08-50-0189	08-50-0187	18-20AWG
	41695	09-50-8061	2478	08-50-0106	08-50-0105	18-20AWG
	2139	09-50-3061	2478	08-50-0106	08-50-0105	18-20AWG
J300	5264-N	50-37-5103	5263	08-70-1040	08-70-1039	22-28AWG

CHASSIS: 0.063" (1.6mm) ALUMINUM ALLOY, WITH CLEAR FINISH

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